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10/612,055	07/03/2003	Myung-Ryul Choi	1293.1734	4299

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EXAMINER	
DANIELSEN, NATHAN ANDREW	
ART UNIT	PAPER NUMBER
2627	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/612,055	CHOI, MYUNG-RYUL	
	Examiner	Art Unit	
	Nathan Danielsen	2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-11 and 13-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-11 and 13-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 2-11 and 13-35 are pending. Claims 1 and 12 have been canceled and claims 33-35 have been added in Applicant's amendment filed 13 July 2006.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2-5, 8, 13-17, 26-30, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kin, in view of Srikrishna et al (US Patent 6,147,834; hereinafter Srikrishna).

Regarding claims 2, 8, 13, and 26, Kin discloses, with respect to drawings 19, 20, and 24, a disk drive reducing noise, comprising:

an air guide plate (clamping member 250) installed between an upper surface of the disk tray (surface 244a) and an upper cover plate (upper part of housing 230) of the disk drive (figure 19), parallel to the disk tray (figure 19), and separating an air flow area (figures 20 and 24), the air flow above the disk generated by rotation of the disk being divided into turbulence under the air guide plate and turbulence above the air guide plate (figure 24),

wherein the air guide plate is installed above and at least partially overtop of the disk (figures 19 and 24).

However, Kin fails to disclose a wedge-shaped end portion.

In the same field of endeavor, Srikrishna discloses where the air guide plate comprises an end portion having a wedge shape (end portions of fins 66 in figure 4) that is inclined in a direction in which the air flow above the disk proceeds to move the air flow above the disk up along the air guide plate (the arrows in figure 2 indicate the direction of flow of the fluid 24; therefore, the direction of fluid flow in figure 4 would be from lower left to upper right with the wedge-shaped portions, especially that of the uppermost

fin, directing a larger flow into the uppermost passageway inlet than would be possible if the fins 66 did not have the wedge-shaped end portions).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the wedge-shaped end portions of Srikrishna to the front right portion of the clamping member 250 (the portion of clamping member 250 which would come in contact with the rotating air θ) of Kin as seen in figure 23A, for the purpose of aiding the transfer of heat from the fins through convection and thus to prolong the life of the drive (col. 5, lines 57-65).

Further regarding claims 2 and 8, Kin discloses where the disk drive further comprises:

a disk tray (disk tray 240) sliding in and out of the disk drive and on which a disk (disk 210) is placed;

a disk driving portion (motor 232 and turntable 234) rotating the disk at a predetermined speed;

a disk chucking apparatus (clamping member 250 and holder 252) holding the disk on the disk tray;

a data recording/reproducing unit recording data on the disk or reproducing data from the disk (optical pickup 236).

Further regarding claim 8, Kin discloses where a through hole is formed at a central portion of the air guide plate through which the disk chucking apparatus is installed (figures 19 and 24).

Further regarding claims 13 and 26, Kin discloses where the disk drive further comprises:

a disk tray (disk tray 240) receiving a disk that is rotated, producing turbulence having a turbulence area above the rotating disk (figure 24);

an upper cover plate (upper part of housing 230) covering the disk drive.

Regarding claims 3, 14, and 27, Kin discloses everything claimed, as applied to claims 2, 13, and 26, respectively. Additionally, Kin discloses where the disk drive further comprises a first guide (outermost groove walls of predetermined clamping member 250 in figure 19) installed on the air guide plate, perpendicular to an upper surface of the air guide plate (figure 19), along an edge of the air guide plate (figure 19) to rotate the air flowing up along the air guide plate in a same direction as a direction in which the disk rotates (figures 23 and 24).

Regarding claims 4, 15, and 28, Kin discloses everything claimed, as applied to claims 3, 14, and 27. Additionally, Kin discloses where the disk drive further comprises a second guide (any of the groove walls of clamping member 250 except the outermost in figure 19) installed on the air guide plate parallel to the first guide (parallel in the disk tangential direction as shown in figure 23), separated a predetermined distance from the first guide (figures 20-24), and perpendicular to the upper surface of the air guide plate (figure 19), to divide a passing route of the air flow into two or more routes (figures 23 and 24) and rotate the air flowing up along the air guide plate in the same direction as the direction in which the disk rotates (figures 23 and 24).

Regarding claims 5, 17, and 30, Kin discloses everything claimed, as applied to claims 4, 15, and 28, respectively. Additionally, Kin discloses where the disk drive further comprises a guide vein (any of the groove walls of predetermined clamping member 250 in figure 19) installed on the air guide plate to rotate the air flowing up along the air guide plate in the same direction as the direction in which the disk rotates (figures 23 and 24).

Further regarding claim 30, Kin discloses where the guide vein reduces turbulence generated above the air guide plate where a direction of the air flow changes (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence).

Regarding claim 16, Kin discloses everything claimed, as applied to claim 15. Additionally, Kin discloses where the disk drive comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 20 and 23).

Regarding claim 29, Kin discloses everything claimed, as applied to claim 28. Additionally, Kin discloses where the disk drive further comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 20 and 23).

Regarding claim 33, Kin discloses where the turbulence above the air guide plate is not directly influenced by the rotating disk (¶s 50-52 and figure 24).

4. Claims 6, 9-11, 18, 19, 21, 23, 24, 31, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kin, in view of Srikrishna, and further in view of Cho et al (US Patent 6,948,176; hereinafter Cho).

Regarding claims 6, 9-11, 18, 19, 21, and 31, Kin, in view of Srikrishna, discloses everything claimed, as applied to claims 4 and 15. Additionally, Kin discloses where the disk drive further comprises a porous air flow control unit to attenuate a strength and a perturbation component of the turbulence flowing above the air guide plate (¶s 50-52). However, Kin, in view of Srikrishna, fails to discloses where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Cho discloses where the porous air flow control unit (sound-absorbent material 248) is installed on the air guide plate (figure 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of Kin with the sound-absorbent material of Cho, for the purpose of reducing noise in an optical disk drive (col. 6, lines 31-33).

Regarding claim 23, Kin discloses a noise reducing apparatus for a disk drive, the disk drive having an upper cover plate (upper part of housing 230) covering the disk drive and a disk tray (disk tray 240) receiving a disk (disk 210) that is rotated, the rotating disk producing turbulence having a turbulence area above the rotating disk (figure 24), the noise reducing apparatus comprising:

an air guide plate (clamping member 250) placed between the disk tray and the upper cover plate to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate, the turbulence area under the air guide plate being reduced to reduce the turbulence above the rotating disk thereby reducing noise of the disk drive (¶s 50-52 and figure 24);

a first guide (outermost groove walls of predetermined clamping member 250 in figure 19) installed on the air guide plate along an edge of the air guide plate (figure 19) to rotate the air flowing up along the air guide plate in a same direction as a direction in which the disk rotates (figures 23 and 24), reducing turbulence at a front edge of the disk drive

(abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence);

a second guide (any of the groove walls of clamping member 250 except the outermost in figure 19) installed on the air guide plate, parallel to the first guide (parallel in the disk tangential direction as shown in figure 23) and separated a predetermined distance from the first guide (figures 20-24), to divide a passing route of the air flow into two or more routes (figures 23 and 24) and rotate the air flowing up along the air guide plate in the same direction as the disk rotation direction (figures 23 and 24);

a guide vein (any of the groove walls of predetermined clamping member 250 in figure 19) installed on the air guide plate to rotate the air flow moving up along the air guide plate in the same direction as the disk rotation direction, reducing turbulence generated above the air guide plate where a direction of the air flow changes (abstract, see also page 2, ¶ 6 of Applicant's disclosure for the relationship between noise and turbulence); and

a porous air flow control unit to attenuate a strength and a perturbation component of the turbulence flowing above the air guide plate (¶s 50-52).

However, Kin fails to disclose a wedge-shaped end portion and where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Srikrishna discloses where the noise reducing apparatus further comprises:

end portion having a wedge shape (end portions of fins 66 in figure 4) that is inclined in a direction in which the air flow above the disk proceeds to move the air flow above the disk up along the air guide plate (the arrows in figure 2 indicate the direction of flow of the fluid 24; therefore, the direction of fluid flow in figure 4 would be from lower left to upper right with the wedge-shaped portions, especially that of the uppermost fin, directing a larger flow into the uppermost passageway inlet than would be possible if the fins 66 did not have the wedge-shaped end portions), reducing a perturbation portion of the turbulence

above the air guide plate (inherent in wedge-shaped structures when compared to flat-ended structures).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the wedge-shaped end portions of Srikrishna to the front right portion of the clamping member 250 (the portion of clamping member 250 which would come in contact with the rotating air θ) of Kin as seen in figure 23A, for the purpose of aiding the transfer of heat from the fins through convection and thus to prolong the life of the drive (col. 5, lines 57-65). However, Srikrishna also fails to disclose where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Cho discloses where the porous air flow control unit (sound-absorbent material 248) is installed on the air guide plate (figure 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of Kin with the sound-absorbent material of Cho, for the purpose of reducing noise in an optical disk drive (col. 6, lines 31-33).

Regarding claim 24, Kin, in view of Srikrishna and Cho, discloses everything claimed, as applied to claim 23. Additionally, Kin discloses where the disk drive comprises a plurality of second guides on the air guide plate to reduce perturbation due to a friction force (figures 20 and 23).

Regarding claim 35, Kin discloses where the turbulence above the air guide plate is not directly influenced by the rotating disk (¶s 50-52 and figure 24).

5. Claims 7, 22, 25, and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Kin, in view of Srikrishna and Cho, and further in view of Balrow et al ("Low-Speed Wind Tunnel Testing" as cited on Applicant's form PTO-1449 dated 03 July 2003; hereinafter Balrow).

Regarding claims 7, 22, 25, and 32, Kin, in view of Srikrishna and Cho, discloses everything claimed, as applied to claims 6, 18, 23, and 31. However, Kin, in view of Srikrishna and Cho, fails to disclose the specific structure of the porous air flow control unit.

In the same field of endeavor, Balrow discloses where the air flow control unit comprises a mesh screen installed on the air guide plate having a screen structure to attenuate turbulence flowing above the

air guide plate in an axial direction and a honeycomb structure to attenuate turbulence in a lateral direction, the mesh screen reducing noise and turbulence by changing an anisotropic strong turbulence to an isotropic weak turbulence ("turbulence in the test section is reduced by the installation of honeycombs and screens; screens reduce the axial turbulence more than the lateral turbulence; honeycombs ... reduce lateral velocities" (page 74, section 2.11, lines 1-6 and page 75, line 1)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the abovementioned structure of Balrow in the porous air flow control unit of Cho in the structure of Kin, for the purpose of reducing turbulence while minimizing overall power loss in the system (page 75, lines 5-6).

6. Claims 20 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kin, in view of Cho.

Regarding claim 20, Kin discloses a disk drive, comprising:

a disk tray (disk tray 240) receiving a disk that is rotated, producing turbulence having a turbulence area above the rotating disk (figure 24);

an upper cover plate (upper part of housing 230) covering the disk drive; and

an air guide plate (clamping member 250) placed between the disk tray and the upper cover plate to separate air flow above the rotating disk into turbulence under the air guide plate and turbulence above the air guide plate, the turbulence above the air guide plate being unaffected by the rotating disk, and the turbulence area under the air guide plate being reduced to reduce the turbulence above the rotating disk (figure 24); and

a porous air flow control unit to attenuate a strength and a perturbation component of the turbulence flowing above the air guide plate (¶s 50-52),

wherein the air guide plate is installed above and at least partially overtop of the disk (figures 19 and 24).

However, Kin fails to disclose where the porous air flow control unit is installed on the air guide plate.

In the same field of endeavor, Cho discloses where the porous air flow control unit (sound-absorbent material 248) is installed on the air guide plate (figure 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of Kin with the sound-absorbent material of Cho, for the purpose of reducing noise in an optical disk drive (col. 6, lines 31-33).

Regarding claim 34, Kin discloses where the turbulence above the air guide plate is not directly influenced by the rotating disk (¶s 50-52 and figure 24).

Response to Arguments

7. Applicant's arguments filed 20 December 2006 with respect to the combination of Kin and Srikrishna have been fully considered but they are not persuasive.

a. Applicant argues that "Kin and Srikrishna, taken separately or in combination, do not disclose, teach, or suggest at least, 'wherein the air guide plate is installed above and at least partially overtop of the disk,' as recited in independent claims 2, 13, and 26; instead, Srikrishna's fins 66 are located to the side of the disk as shown in Figures 1, 3, and 4 of Srikrishna" (page 9). The examiner disagrees with the first part of this argument and fails to see how the second part is relevant to the first part. Regarding the first part of the aforementioned argument, figure 24 of Kin clearly shows where the air guide plate 250 is installed above and at least partially overtop of the disk. Further, due to the shape of the air guide plate 250 and its disclosed location, it is not located fully overtop the disk but only partially since the corners extend beyond the radius of the disk, as shown in figure 23. Therefore, Kin teaches the features newly added to the claims.

8. Applicant's arguments with respect to claim 8 have been considered but are moot in view of the new ground(s) of rejection.

Citation of Relevant Prior Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Ishii et al (JP Patent Application Publication 2001-176260) and Imasaka (JP Patent Application Publication 2001-110175) disclose additional types of air guide/noise reduction members provided on the inside of optical disc drives.

Closing Remarks/Comments

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Danielsen whose telephone number is (571) 272-4248. The examiner can normally be reached on Monday-Friday, 9:00 AM - 5:00 PM Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nathan Danielsen ND
02/15/2007

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER